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COUNTY OF LOS ANGELES

DEPARTMENT OF PUBLIC WORKS

"To Enrich Lives Through Effective and Caring Service"

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GAIL FARBER, Director

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ALHAMBRA, CALIFORNIA 91802-1460

IN REPLY PLEASE
REFER TO FILE: EP-4
A4209-1

August 20, 2015

TO: Each Supervisor

FROM: Gail Farber
Director of Public Works

BOARD MOTION OF JANUARY 27, 2015, ITEM NO. 21-A
SEMI-ANNUAL STATUS REPORT: JANUARY THROUGH JULY 2015

On January 27, 2015, the Board adopted a motion by Supervisor Mark Ridley-Thomas instructing the Director of Public Works to provide semi-annual reports in writing that include clear benchmarks for measuring the actual progress being made towards establishing viable conversion technology projects, in conjunction with the Boards' approval of a technical services contract with Alternative Resources Incorporated to assist the County of Los Angeles and potential project developers in developing conversion technology projects in the County.

Attached is a report in response to this motion for the period of January to July 2015. If you have any questions regarding this report, please contact me or your staff may contact Mr. Pat Proano at (626) 458-3500 or pproano@dpw.lacounty.gov.

CS:td
H:/adhome/aortega/EPD/CT 6 Month Report memo 2015 08 04

Attach.

cc: Chief Executive Office (Rochelle Goff)
County Counsel
Executive Office
Department of Public Health
Department of Regional Planning
Los Angeles County Integrated Waste Management Task Force
Regional Planning Commission
Sanitation Districts of Los Angeles County

CONVERSION TECHNOLOGY PROGRAM

SEMI-ANNUAL STATUS REPORT

January – July 2015

Prepared by the County of Los Angeles Department of Public Works

Cover Photos

Top Left: Reclaimable Anaerobic Composter at Lancaster Landfill

Top Right: County Sanitation Districts Food Waste Digestion Project in Carson, CA

Bottom: CR&R Anaerobic Digestion Facility in Perris, CA

1.0 Executive Summary

This report responds to the January 27, 2015, motion by Supervisor Mark Ridley-Thomas to report on progress regarding conversion technologies. The report details three conversion technology projects that have achieved significant progress in the last 6 months, includes a discussion of actions taken by the City of Los Angeles that support this technology, provides benchmarking and milestones, next steps, and an appendix of legislation related to conversion technologies. The projects are:

1. Joint Water Pollution Control Plant – This is a joint effort between Waste Management Company and the County Sanitation Districts. Waste Management currently supplies 25 tons per day (tpd) of food waste to the Districts' Plant in Carson. Public Works and the Districts are working to bring additional organic waste to the facility for processing.
2. Perris Materials Recovery Facility, CR&R Incorporated – This privately developed, $25 million conversion technology facility in Riverside County will be completed this fall and will process 150 tpd of organic waste using anaerobic digestion.
3. Lancaster Landfill, LARGO – This is a project under development by Waste Management to build anaerobic digestion and composting at the Lancaster Landfill. The project will be able to process up to 2,000 tpd of green waste and other waste material.

City of Los Angeles – The City of Los Angeles is moving towards an exclusive commercial franchise system, which will provide companies collecting the waste a dedicated waste stream, making it financially viable to develop new conversion technology facilities. In addition, the City of Los Angeles is negotiating the purchase of the Southeast Resource Recovery Facility, a waste to energy facility in Long Beach, currently under operation.

Benchmarking and Milestones - This Program sets benchmarks based on current waste disposal quantities and the disposal reduction targets established in the County's Roadmap as well as State laws, such as Assembly Bill 1826 (AB 1826). Public Works has established numerical milestones in this report to measure our progress in implementing the Program, starting with our current in-County conversion technology capacity of 84 tpd and continuously increasing the capacity to reach 3,000 tpd of capacity by 2035.

Conclusion – Conversion technology projects are being successfully developed. Public Works will continue to facilitate the development of these projects in the County, by providing technical assistance, educating stakeholders, and working to remove regulatory barriers. Conversion technologies are critical to reducing our reliance on landfills and recovering energy, fuels, and other products from waste. Currently in the County, 8.6 million tons of waste is disposed at landfills each year; ultimately, conversion technologies will supersede landfills in managing this waste.

2.0 Background

On January 27, 2015, the County of Los Angeles Board of Supervisors adopted a motion by Supervisor Mark Ridley-Thomas instructing the Director of Public Works to provide semi-annual reports in writing that include clear benchmarks for measuring the actual progress being made towards establishing viable conversion technology (CT) projects, including the amount of waste to be diverted, financial viability, project status, and significant impediments that will allow the Board to meaningfully assess the efficacy of conversion technologies in meeting the County's goal of a sustainable waste management future. This report is in response to that motion for the period of January to July 2015.

On that day, the Board also awarded a 5-year technical services contract to Alternative Resources Incorporated to help Public Works and potential project developers in developing CT projects in Los Angeles County, by providing technical assistance, preparing economic analyses, performing market research, completing project planning, and conducting stakeholder outreach.

Last year, the Board adopted the Roadmap to a Sustainable Waste Management Future, which established waste diversion targets of 80 percent by 2025, 90 percent by 2035 and 95 percent or more by 2045. The successful development of CTs is vital to achieving these targets, since only so much of the waste generated can be reduced, reused, or recycled in an economically feasible way.

3.0 Project Development Highlights

The following CT projects have achieved significant progress in the last 6 months.

3.1 Joint Water Pollution Control Plant, County Sanitation Districts of Los Angeles County and Waste Management Company

In 2013, the County Sanitation Districts partnered with Waste Management Company (WM) to establish a demonstration project at the District's Joint Water Pollution Control Plant (JWPCP) in Carson, California. As part of this project, WM collects food waste, cleans and processes it into a slurry, and delivers it to the JWPCP where it is co-digested with sewage sludge to create biogas which is converted into electricity. The project has been operating for more than one year, recovering approximately 25 tpd of food waste with virtually no issues. The Districts determined that it can be technically viable to expand the co-digestion project at JWPCP into a commercial-scale anaerobic digestion facility. The agreement with WM allows for up to 84 tpd to be processed, and the Districts have determined that additional organics can be processed if a consistent clean supply can be secured in a financially viable manner.

Utilizing existing anaerobic digestion capacity at wastewater treatment plants such as the JWPCP overcomes a number of significant impediments to the development of viable CTs. Most significantly, the facility can begin to process organic waste with minimal initial capital costs and has significant flexibility in the quantity of organic waste

it can accept and blend with sewage sludge for digestion, thereby avoiding the need to establish significant waste supply contracts ordinarily required for CT project development. The drawbacks to the system include the need to thoroughly process and clean any organic waste that is used as a feedstock in the system, and the limited availability of local excess digestion capacity at wastewater treatment plants, since these plants must ensure sufficient capacity for their core function of treating wastewater.

To make use of this available capacity and help ramp up demand for more CT facilities, Public Works and the Districts are working with waste haulers to develop a program for collecting a minimum of 40 tons of food waste per week from the Firestone Garbage Disposal District and commercial franchise areas in the San Gabriel area of the County. The food waste material would be taken to the Districts' Puente Hills Materials Recovery Facility where, after it is processed further, it will be delivered to JWPCP to be converted into energy. This program would provide insight on the challenges and costs associated with separate organic waste collection, which can be reviewed before being implemented throughout the unincorporated County areas.

3.2 Perris Materials Recovery Facility, CR&R Incorporated

CR&R Waste and Recycling Services, a local solid waste management company, has nearly completed construction of a 150-tpd anaerobic digestion project at their Perris Materials Recovery Facility and Transfer Station in Riverside County. The project is designed to convert organic waste into renewable fuels for use by their waste collection vehicles. As approved by the Board in 2010, Public Works assisted CR&R by providing technical assistance as well as assisting them in successfully pursuing grant funding for the facility. Thanks in part to support and assistance from the County, this project was successful in receiving a total of nearly $8 million in grant funding to date - $4.82 million from the California Energy Commission, $100,000 from the South Coast Air Quality Management District/Mobile Source Air Pollution Reduction Review Committee, and $3 million from the California Department of Resources Recycling and Recovery.

This facility has plans to scale-up in phases and ultimately process 1,000 tpd, which could allow the facility to process organic waste generated in Los Angeles County. The grants received to date have helped to accelerate future phases of the project. Design and permitting for the project began in 2010, while construction began in 2014. The initial phase of the project is estimated to cost approximately $25 million and is expected to begin operation in fall 2015. The facility will serve as a reference for viable CT projects that can separate the organic fraction of the waste stream and the County will benefit from the lessons learned in successfully developing this project.

3.3 Lancaster Landfill, Waste Management Company

On July 10, 2013, WM issued an Invitation-Only Request for Proposals for a green waste and food waste processing facility on designated land within the boundaries of WM's Lancaster Landfill, located in the unincorporated region of the County near the

City of Lancaster. Recently, WM has secured initial agreements with a successful private company that has successfully developed similar projects in California to move forward with a full-scale organics digestion and composting operation (referred to as the Lancaster Advanced Recycling for Green waste and Organics project, aka LARGO). WM intends for LARGO to eventually be able to process up to 2,000 tpd of green waste, food waste, and other waste material.

WM is currently requesting technical assistance from Public Works' Conversion Technology Program in order to assist with permitting, environmental review, and pursuing grants for the project. To facilitate the permitting of this facility, Public Works has done extensive research of the Statewide Programmatic Environmental Impact Report for Anaerobic Digestion as well as other projects' environmental documents such as San Jose's anaerobic digestion facility, and developed recommendations for the development of environmental documentation for LARGO. We will be coordinating with Regional Planning and County Counsel as the project moves forward.

3.4 City of Los Angeles

In 2015, the City of Los Angeles released a Request for Proposals (RFP) to provide solid waste, commingled recyclables, and organics collection, transfer, disposal and processing services to commercial and multifamily establishments in the City. The City intends to enter into exclusive franchise agreements to provide the services described in the RFP. The RFP requires proposers to demonstrate how the facilities they plan to use would be able to effectively and efficiently process all yard trimmings and food waste materials collected from each franchise area. The companies that are awarded the contract for each franchise will have a dedicated waste stream, making it financially viable to develop new organics/CT facilities in the vicinity of the City of Los Angeles. Having this dedicated waste stream is a major factor in developing CTs, and it would be financially advantageous for these facilities to process organic waste originating from other jurisdictions in addition to the City.

Additionally, on October 14, 2014, the City Council of the City of Los Angeles authorized the Bureau of Sanitation to pursue negotiations with the City of Long Beach and the Districts for a partnership in the ownership and operation of Southeast Resource Recovery Facility for the processing of municipal solid waste for the City of Los Angeles. On May 7, 2015, Covanta Long Beach Renewable Energy announced an extended agreement with the City of Long Beach for the operations and maintenance of Southeast Resource Recovery Facility. The amended agreement, which was approved by the Long Beach City Council, extends the term of the current agreement to 2024.

4.0 Benchmarking and Milestones

The goal for the Conversion Technology Program is to reduce our dependence on landfills and ensure there is sufficient, sustainable capacity available to the County to meet future needs. Public Works set benchmarks for the program based on current waste disposal quantities and the disposal reduction targets established in the County's

Roadmap as well as State laws, such as Assembly Bill 1826 (AB 1826), discussed in more detail in Appendix A. Among other things, AB 1826 established a Statewide goal to reduce the amount of organic waste disposed in landfills from 2014 volumes by at least 50 percent by 2020. To meet this goal in Los Angeles County would require diverting approximately 5,000 tpd of organic waste from landfill disposal. Although a significant portion of this organic waste will be diverted using composting and land application, additional conversion technology facilities will be needed to meet this goal.

The following milestones have been identified to measure our progress:

Timeframe	Milestone	Capacity (tons per day)
Today	County Sanitation Districts anaerobic digestion co-digestion at Carson facility	84 (can be expanded in the future)
12/31/15	Construction of Perris anaerobic digestion facility	150
12/31/20	In-County conversion technology capacity (projection)	200
12/31/25	In-County conversion technology capacity (projection)	500
12/31/35	In-County conversion technology capacity (projection)	3,000

Since it will take seven to ten years to permit and construct a conversion technology facility, the benchmarks for the next ten years are relatively modest. After a small number of facilities become operational and demonstrate their viability, the market for conversion technology in the County will expand quickly. Achieving 2025 and 2035 milestones will require investment by the private sector. Although the County does not have direct control over the timing of these projects, State mandates are driving business development which will lead to projects being developed in the next few years. To accelerate this investment, Public Works can take a number of steps, as described below.

5.0 Next Steps

- Work with the County Sanitation Districts to implement an organic waste collection program, with the goal of increasing the anaerobic digestion of food waste in the County.
- Provide technical assistance to facilitate Waste Management Company's LARGO project, including permitting assistance, environmental review, and support for grant applications.
- Release a comprehensive, peer reviewed CT White Paper that compares the greenhouse gas emissions from an integrated CT to transporting an equivalent amount of waste to a landfill.

- In collaboration with Regional Planning, prepare a draft Recycling and Waste Facilities Ordinance which will ensure these types of facilities have appropriate zoning as well as permitting process.
- Continue to serve as a resource and catalyst for CT project development in the County for other CT projects in various stages of development, such as potential projects at Scholl Canyon Landfill in Glendale, Pitchess Detention Center in Castaic, and Interior Removal Specialists Recycling in South Gate.

As described in Appendix A, legislative barriers have historically been a major impediment to the development of CTs in California. Senate Bill 498 (authored by Senator Ricardo Lara in 2014 and sponsored by the County), cleared a significant hurdle for the siting of biomass conversion facilities in the County by providing waste diversion and renewable energy credit to such facilities. It is important for the County to consider sponsoring another CT bill that would build on the success of Senate Bill 498, by expanding the definition of biomass conversion to other types of feedstock. Senator Lara visited the Districts' food waste co-digestion project at the JWPCP in Carson, California and is in support of sponsoring additional legislation on this issue.

Public Works will continue to facilitate the development of CTs in the County, by working with stakeholders to identify barriers and creating solutions to those barriers as described in this report.

Public Works' next status report will be submitted in January 2016 for the period August through December 2015.

Appendix A – Legislation

Recently Adopted Legislation:

Senate Bill 498

Senate Bill 498 (SB 498), authored by Senator Ricardo Lara, expanded the definition of "biomass conversion" to include the use of noncombustion thermal conversion technologies. State law formerly limited "biomass conversion" to only the controlled *combustion* of biomass and only when used for producing electricity or heat. By adding "conversion technologies" to the definition of "biomass conversion," SB 498 allows for cleaner and more efficient noncombustion thermal technologies to be used to convert biomass into fuels and products in addition to heat and/or electricity.

The County played a major role in sponsoring SB 498. The language in SB 498 was developed by the County and California State Association of Counties (CSAC) following discussions with the CalRecycle and key Sacramento stakeholders. Public Works, working in coordination with the County's legislative advocates in Sacramento and CSAC, successfully pursued the passage of SB 498, which was passed by the legislature and signed into law by Governor Brown on September 28, 2014. This is the first successful legislative effort to add the term "conversion technologies" to State statute. However, the definition of biomass is limited to certain organic materials, such as wood, lawn and garden clippings, agricultural waste, leaves, tree pruning, and nonrecyclable paper, when separated from other solid waste. Other nonrecyclable components of the waste stream cannot be sent to a biomass conversion facility; as a result additional legislation may still be needed.

Governor Brown GHG Executive Order

On April 29, 2015, Governor Brown issued Executive Order B-30-15 to establish an interim greenhouse gas reduction target of 40 percent below 1990 levels by 2030. Currently, it is expected that California will be able to reduce greenhouse gas emissions levels to 1990 levels by 2020, but this new executive order will help the State meet the goal of reducing emissions to 80 percent below 1990 levels by 2050, as enacted in Executive Order S-3-05 by Governor Arnold Schwarzenegger in 2005. Governor Brown's executive order is the most aggressive carbon emissions reduction benchmark established in North America for the next 15 years. CTs and the greenhouse gas emission reductions associated with the CTs are critical to meeting the 2030 and 2050 benchmarks.

Assembly Bill 1826

Another bill that has a major impact in facilitating the development of CTs is Assembly Bill 1826 (AB 1826), enacted on September 28, 2014. AB 1826 mandates the collection and recycling of compostable organic waste generated by businesses, multifamily residences of five or more, schools, and other public facilities. Beginning in 2016, businesses that generate 8 cubic yards of organic waste must arrange for organic recycling services including food scraps. This threshold will be lowered to 4 cubic yards

of organic waste in 2017, 4 cubic yards of commercial solid waste in 2019, and 2 cubic yards of commercial solid waste in 2020. The 2020 threshold is conditional on meeting State recycling goals. Multifamily residences of five or more units are also required to recycle organics but exempt from recycling food scraps. Although "organic recycling services" is not defined in the law, it does require businesses to either source separate recyclable materials from solid waste and subscribe to a basic level of recycling services that includes collection, self-hauling, or other arrangements for pickup of the recyclable materials, or subscribe to a recycling service that may include mixed waste processing that yields diversion results comparable to source separation. Assembly Bill 1826 requires each jurisdiction, on and after January 1, 2016, to implement an organic waste recycling program to divert organic waste from the businesses subject to this act. Through implementing the program, jurisdictions must report to CalRecycle on its progress of identifying businesses, education and outreach, and monitoring the businesses' compliance with the law.

Pending Legislation (as of July 27, 2015):

Senate Bill 32

The California Global Warming Solutions Act of 2006, also known as Assembly Bill 32, establishes a goal to reduce Statewide greenhouse gas emissions equivalent to the Statewide emissions levels in 1990 by 2020. Senate Bill 32, introduced by Senator Fran Pavley, requires the State Air Resources Board to approve a Statewide greenhouse gas emission limit that is equivalent to 80 percent below the 1990 level to be achieved by 2050. The bill would also authorize the State board to adopt interim greenhouse gas emissions level targets to be achieved by 2030 and 2040. Without conversion technologies and the greenhouse gas emission reductions associated with the technologies it would be difficult for the State to meet these goals. Therefore, this bill may help the advancement of conversion technologies. The County is evaluating this bill to determine whether to recommend taking a formal position.

Senate Bill 350

The California Clean Energy and Pollution Reduction Act of 2015 includes 3 key proposals: reduce petroleum use in motor vehicles by 50 percent, double the energy efficiency of buildings, and increase the use of renewable electricity to 50 percent by 2030. CTs have the ability to generate renewable electricity and fuels from waste and therefore assist the State in meeting these environmental goals. The County is evaluating this bill to determine whether to recommend taking a formal position.

Senate Bill 687

Senate Bill 687 would require the State Air Resources Board (CARB), on or before June 30, 2017, in consultation with the State Energy Resources Conservation and Development Commission and the Public Utilities Commission to adopt a carbon-based renewable gas standard that would require all gas sellers to provide minimum percentages of renewable gas to retail customers in California. Modeled similar to the State's Renewable Portfolio Standard, which has doubled renewable electricity in the

State since 2002, the required percentage of renewable gas would gradually increase from 1 percent to 10 percent over a 10-year period beginning in 2019 and is intended to spur the in-State biomethane market. The bill would also require the CARB to issue an analysis of the lifecycle emissions of greenhouse gases and reductions for different biogas types and end uses by January 1, 2017. The bill is a 2-year bill which means it will be on hold until 2016. The County is on record in support of this bill.

Assembly Bill 577

Authorized pursuant to AB 32, monies collected by the CARB from the auction or sale of greenhouse gas emission allowances, otherwise known as "cap and trade," is deposited into the Greenhouse Gas Reduction Fund. Assembly Bill 577 would require the State Energy Resources Conservation and Development Commission to use an unspecified amount of money from State's Greenhouse Gas Emission Reduction Fund to develop and implement a grant program to award grants for projects that produce biomethane, that build or develop collection and purification technology or infrastructure, or that upgrade or expand existing biomethane facilities. The bill is intended to provide certainty in the biogas market which may attract further private development in this sector. The County is on record in support of this bill.

V. MISCELLANEOUS

21. Additions to the agenda which were posted more than 72 hours in advance of the meeting, as indicated on the supplemental agenda. (12-9995)

21-A. Recommendation as submitted by Supervisor Ridley-Thomas: Instruct the Director of Public Works to provide semi-annual reports in writing that include clear benchmarks for measuring the actual progress being made towards establishing viable conversion technology projects, including amount of waste to be diverted, financial viability, project status, and significant impediments that will allow the Board to meaningfully assess the efficacy of conversion technologies in meeting the County's goal of a sustainable waste management future. (Relates to Agenda No. 16) (15-0472)

On motion of Supervisor Solis, seconded by Supervisor Antonovich, this item was approved.

Ayes: 5 - Supervisor Solis, Supervisor Ridley-Thomas, Supervisor Kuehl, Supervisor Knabe and Supervisor Antonovich

Attachments: Motion by Supervisor Ridley-Thomas
Report

21-B. Recommendation as submitted by Supervisor Antonovich: Declare the month of February as "Spay/Neuter Awareness Month" throughout Los Angeles County in an effort to reduce the amount of homeless animals, while promoting healthy pet practices. (15-0461)

On motion of Supervisor Antonovich, seconded by Supervisor Solis, this item was approved.

Ayes: 5 - Supervisor Solis, Supervisor Ridley-Thomas, Supervisor Kuehl, Supervisor Knabe and Supervisor Antonovich

Attachments: Motion by Supervisor Antonovich

AGN. NO.

MOTION BY SUPERVISOR MARK RIDLEY-THOMAS January 27, 2015

Providing Justification for Conversion Technology Investment
Relates to Agenda Item 16

Since 2010, the Los Angeles County (County) Department of Public Works has pursued various strategies to increase the utilization of non-combustion conversion technologies, which are aimed at reducing the amount of waste being sent to landfills, and are considered sustainable waste management solutions.

These facilities have proven to be very difficult to develop locally. Various legislative and regulatory frameworks have made these facilities complicated to permit and operate in California. The County has promoted alternative methods of waste disposal, and provided technical assistance to project developers to further this effort. However, there are no commercial-scale facilities yet operational within the County.

Progress was made in 2014 with the passage of County-sponsored Senate Bill 498, which helps clear the pathway to allow cleaner and more efficient technologies to be used to make low-carbon fuels as well as renewable energy from certain types of organic waste. However, significant work still needs to be done to ensure these technologies can be scalable to meet the County's goals. The Board of Supervisors (Board) recently approved a roadmap for a sustainable waste management future, which entails diverting 80 percent of solid waste from landfills by 2025.

- MORE -

	MOTION
SOLIS	
RIDLEY-THOMAS	
KUEHL	
KNABE	
ANTONOVICH	

In 2014, Governor Brown also signed into law AB 1826, which requires businesses and government entities which generate organic waste to recycle. This bill also requires local jurisdictions to develop an organics management plan by December 31, 2015. This will require the waste industry to develop a number of conversion technology facilities to process organic material and the County to facilitate the permitting and development of these facilities.

Deployment of conversion technologies may help to divert a substantial amount of this waste stream. In order to realize this goal, the County must identify the specific barriers to rapidly and cost-effectively developing commercial-scale projects within the County. The Board should review data on the cost-effectiveness of this strategy and have a realistic sense of the timeframe and viability of scaling up this investment to meet the County's waste management needs.

I THEREFORE MOVE THAT THE BOARD OF SUPERVISORS:

Direct the Director of the Department of Public Works to provide semi-annual reports in writing that include clear benchmarks for measuring the actual progress being made towards establishing viable conversion technology projects (including amount of waste to be diverted, financial viability, project status, and significant impediments) that will allow the Board of Supervisors to meaningfully assess the efficacy of conversion technologies in meeting the County of Los Angeles' goal of a sustainable waste management future.

####

(KK)

COUNTY OF LOS ANGELES

DEPARTMENT OF PUBLIC WORKS

"To Enrich Lives Through Effective and Caring Service"

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March 9, 2016

IN REPLY PLEASE
REFER TO FILE: EP-4
A4209-2

TO: Each Supervisor

FROM: Gail Farber
Director of Public Works

BOARD MOTION OF JANUARY 27, 2015, ITEM NO. 21-A
CONVERSION TECHNOLOGY PROJECTS
SEMI-ANNUAL STATUS REPORT: AUGUST 2015 THROUGH JANUARY 2016

On January 27, 2015, the Board adopted a motion by Supervisor Mark Ridley-Thomas instructing the Director of Public Works to provide semi-annual reports in writing that include clear benchmarks for measuring the actual progress being made towards establishing viable conversion technology projects, in conjunction with the Boards' approval of a technical services contract with Alternative Resources Incorporated to assist the County of Los Angeles and potential project developers in developing conversion technology projects in the County.

Attached is the second report in response to this motion for the period of August 2015 through January 2016. If you have any questions regarding this report, please contact me or your staff may contact Daniel J. Lafferty at (626) 458-3500 or dlaff@dpw.lacounty.gov.

CS:jl
P:\Sec\Semi-Annual CT Letter_February 2016.doc

Attach.

cc: Chief Executive Office (Rochelle Goff)
County Counsel
Executive Office
Department of Public Health
Department of Regional Planning
Los Angeles County Integrated Waste Management Task Force
Regional Planning Commission
Sanitation Districts of Los Angeles County

CONVERSION TECHNOLOGY PROGRAM

SEMI-ANNUAL STATUS REPORT

August 2015 – January 2016

Prepared by the County of Los Angeles Department of Public Works

Cover Photos

Top Left: Pitchess Detention Center in Castaic, CA

Top Right: County Sanitation Districts Food Waste Digestion Project in Carson, CA

Bottom: CR&R Anaerobic Digestion Facility in Perris, CA

1.0 Executive Summary

This is the second report, which responds to the January 27, 2015, motion by Supervisor Mark Ridley-Thomas to report on progress regarding conversion technologies. The report details four conversion technology projects that have achieved significant progress in the last 6 months, as well as benchmarking and milestones, and next steps.

The projects are:

1. Joint Water Pollution Control Plant – This is a joint effort between Waste Management (WM) Company and the County Sanitation Districts (Districts). WM continues to supply 25 tons per day (tpd) of food waste to the Districts' Plant in the City of Carson. The Department of Public Works and the Districts are conducting a pilot food waste collection program in selected unincorporated County of Los Angeles areas, which brings additional organic waste to the facility for processing.
2. Perris Materials Recovery Facility, CR&R Incorporated – This privately developed, $25 million conversion technology (CT) facility in Riverside County completed construction of the Phase I digester and will begin operation in spring 2016. Construction of Phase II recently began. Each phase of the facility will process up to 230 tpd of organic waste using anaerobic digestion.
3. Lancaster Landfill, LARGO – This project by WM has initiated the permitting process to build an anaerobic digestion and composting facility at the Lancaster Landfill. The project will be able to process up to 2,000 tpd of organic waste.
4. Pitchess Detention Center, Los Angeles County Sheriff's Department – This potential project would digest food and green waste from the Pitchess Detention Center in addition to organic waste from nearby County facilities. Public Works is providing technical assistance to the Sheriff's Department for this potential project.

Benchmarking and Milestones – The initial Semi-Annual Report established numerical milestones to measure progress in implementing the CT Program starting with the current in-County CT capacity of 84 tpd and continuously increasing the capacity to reach 3,000 tpd of conversion capacity by 2035. In addition to the potential projects in Lancaster and Pitchess Detention Center, the Districts' facility in Carson is likely to develop additional capacity to process organic solid waste. Thus, the County is on track to achieve the next milestone of 200 tpd in-County waste conversion capacity by 2020.

Conclusion – CTs have the ability to play a critical role in reducing our reliance on landfills and recovering energy, fuels, and other products from waste. CT projects are making significant progress in the County. Public Works will continue to facilitate the

development of these projects by providing technical assistance, educating stakeholders, and working to remove regulatory barriers.

2.0 Background

On January 27, 2015, the County of Los Angeles Board of Supervisors adopted a motion by Supervisor Mark Ridley-Thomas instructing the Director of Public Works to provide semi-annual reports in writing that include clear benchmarks for measuring the actual progress being made towards establishing viable CT projects, including the amount of waste to be diverted, financial viability, project status, and significant impediments that will allow the Board to meaningfully assess the efficacy of conversion technologies in meeting the County's goal of a sustainable waste management future. This is the second report in response to that motion for the period of August 2015 to January 2016.

In October 2014, the Board adopted the Roadmap to a Sustainable Waste Management Future, which established waste diversion targets of 80 percent by 2025, 90 percent by 2035, and 95 percent or more by 2045. The successful development of CTs is key to achieving these targets since it is not economically feasible to reduce, reuse, or recycle the entire waste stream.

3.0 Project Development Highlights

The following CT projects have achieved progress in the last 6 months.

3.1 Joint Water Pollution Control Plant, County Sanitation Districts of Los Angeles County and Waste Management Company (WM)

In 2013, the Districts partnered with WM to establish a demonstration project at the District's Joint Water Pollution Control Plant (JWPCP) in the City of Carson, California. As part of this project, WM collects food waste, cleans and processes it into a slurry, and delivers it to the JWPCP where it is co-digested with sewage sludge to create biogas which is converted into electricity. The project has been operating roughly two years, recycling approximately 25 tpd of food waste with virtually no issues. The Districts determined that it can be technically viable to expand the co-digestion project at JWPCP into a commercial-scale anaerobic digestion facility. The agreement with WM allows for up to 84 tpd to be processed, and the Districts have determined that additional organics can be processed if a consistent clean supply can be secured in a financially viable manner.

Public Works and the Districts are working with waste haulers to develop pilot programs for collecting food waste from the Firestone and Belvedere Garbage Disposal Districts (GDDs) and commercial franchise areas in the San Gabriel area of the County. Food waste collection began in the Firestone GDD on October 20, 2015, and in the Belvedere

GDD on January 5, 2016. The pilot commercial food waste collection program is expected to begin in spring 2016.

The food waste material is taken to the Districts' Puente Hills Materials Recovery Facility where after it is processed further, it is delivered to JWPCP to be digested and converted into energy. The Districts have partnered with Anaergia, a renewable energy and waste-to-resources company, to pilot a small-scale "press" at Puente Hills Materials Recovery Facility. Public Works has arranged to send loads from County unincorporated areas for pilot testing. The press is an advanced material separation technology that recovers organics from the waste stream by separating the dry inorganic fraction of the waste from the wet organic fraction. The press will also help with determining organics recovery rates and contamination levels of different types of commercial and residential loads. This program will provide insight on the challenges and costs associated with separate organic waste collection, which can be reviewed before being implemented throughout the unincorporated County areas.

The Districts also signed a contract with Kore Infrastructure, LLC to convert a portion of the biosolids from JWPCP to biofuel using pyrolysis and Fischer-Tropsch Technology at a facility in Rialto, California. Pyrolysis is a type of gasification, which is a non-combustion thermal conversion technology. The Fischer-Tropsch Technology uses chemical processes to convert gases into liquid fuels.

3.2 Perris Materials Recovery Facility, CR&R Incorporated

CR&R Waste and Recycling Services, a local solid waste management company, has completed construction of a 230 tpd anaerobic digestion project at the Perris Materials Recovery Facility and Transfer Station in Riverside County. The project is designed to convert organic waste into renewable fuels for use by their waste collection vehicles. As approved by the Board in 2010, Public Works assisted CR&R by providing technical assistance as well as assisting them in successfully pursuing grant funding for the facility. Thanks in part to support and assistance from the County, this project was successful in receiving a total of nearly $9 million in grant funding to date - $4.5 million from the California Energy Commission, $1.4 million from the South Coast Air Quality Management District/Mobile Source Air Pollution Reduction Review Committee, and $3 million from the California Department of Resources Recycling and Recovery. The grants received to date have helped to accelerate the development of the project.

This facility has plans to scale-up in four equal phases and ultimately digest up to 1,075 tpd, which could allow the facility to process organic waste generated in unincorporated Los Angeles County. The facility is also expected to process waste from the City of Los Angeles starting in 2017. Phase I was completed and is expected to begin operation in April 2016. Phase II is currently under construction and is expected to be complete in summer 2016. The facility will serve as a reference for viable

CT projects that can separate the organic fraction of the waste stream, and we are benefiting from the lessons learned in successfully developing this project.

3.3 Lancaster Landfill, Waste Management

On July 10, 2013, WM issued an Invitation-Only Request for Proposals for a green waste and food waste processing facility on designated land within the boundaries of WM's Lancaster Landfill, located in the unincorporated region of the County near the City of Lancaster. WM secured an agreement with Zero Waste, LLC, that has successfully developed similar projects in California to move forward with a full-scale organics digestion and composting operation (referred to as the Lancaster Advanced Recycling for Green waste and Organics project, aka LARGO), which will eventually be able to process up to 2,000 tpd of organic waste. The anaerobic digester is estimated to process approximately 250 tpd of the organic waste and the rest to be composted.

Public Works' CT Program provided technical assistance to WM with permitting, environmental review, and pursuing grants for the project. WM is currently preparing the materials necessary to move forward with permitting the new facility with the Department of Regional Planning.

3.4 Pitchess Detention Center, Los Angeles County Sheriff's Department

In April 2013, the Los Angeles County Sheriff's Department (LASD) requested assistance from Public Works in implementing a small scale in-vessel composting system to manage organic waste and provide soil amendments for farm operations at Pitchess Detention Center (PDC), a cluster of jail facilities in Castaic, California. Subsequently, LASD and Public Works received a proposal from an organics processer to consider expanding the scope of the composting system to include an anaerobic digester, which would process source-separated food and green waste to create biogas for energy generation and heat as well as compost for farming operations. Such a facility could receive and process food and green waste from other County departments, as well as potentially the surrounding areas and provide compost and renewable energy or biofuels to other County departments.

The proposed project has numerous potential benefits. It would help conserve natural resources and reduce landfill disposal, thereby assisting County Departments and potentially businesses in complying with State mandates, including Assembly Bill (AB) 1826, AB 341, and AB 32. This project aligns with the strategies outlined in the Roadmap to a Sustainable Waste Management Future and County Strategic Plan. By diverting food waste into the composting and anaerobic digestion system, the project would reduce traffic and pollution from trash hauling. The anaerobic digestion facility would be mutually beneficial to all parties involved and create useful products including a rich soil amendment for PDC farmland and biogas that could be used for low carbon electricity and heat generation, and vehicle fuel. The facility would also reduce costs associated with trash disposal, water usage and sewer fees, kitchen clarifier cleanout

fees, and compost expenses. Additionally, the project could potentially provide job training opportunities for inmates or job opportunities for former inmates.

Public Works and LASD have finalized an economic analysis for the three potential phases of this project. The initial phase includes recycling 1,000 tons per year of food waste and green waste from PDC, and the remaining two phases would add feedstock from other County facilities or other regional sources. It has been calculated that a facility capacity of 40,000 tons per year would provide economic feasibility. However, additional consideration would need to be given to the availability and commitment of organic waste feedstock within the region. Working with a consultant, Public Works, and LASD are determining the details for issuing a Request for Qualifications and Proposals for the design, permitting, construction, commissioning, and operation of the anaerobic digestion project.

4.0 Public Outreach

A Comparative Greenhouse Gas (GHG) Emissions Analysis was commissioned by Public Works to compare the net GHG emissions of two scenarios. The baseline scenario is a transport and disposal of residuals from a mixed waste Materials Recovery Facility (MRF) in a modern sanitary landfill. The alternative scenario is processing the residuals at an Integrated MRF with CT. The Comparative Analysis shows the net environmental benefits of managing residual solid waste using anaerobic digestion and gasification at an integrated CT facility, as opposed to transporting it to a landfill for disposal. This analysis will provide tremendous assistance in educating stakeholders of the necessity for CT facilities to improve air quality and combat climate change. Public Works plans to release the Comparative Analysis in the next few weeks.

The Los Angeles County Integrated Waste Management Task Force and its Alternative Technology Advisory Subcommittee, in conjunction with the County of Los Angeles, the BioEnergy Producers Association and UCLA's Extension Recycling/Municipal Solid Waste Management Program will be co-sponsoring a conference in spring 2016 that will present the findings of the Comparative Analysis and address how to best motivate State government to include CTs in their AB 341 implementation planning and future policy-making. The County's CT consultant is currently assisting with conference logistics, preparing the conference agenda, and reaching out to potential speakers and attendees.

5.0 Benchmarking and Milestones

The goal for the CT Program is to reduce the dependence on landfills and ensure there is sufficient, sustainable capacity available to the County to meet future needs. Public Works set benchmarks for the program based on current waste disposal quantities and the disposal reduction targets established in the County's Roadmap as well as State laws, such as AB 1826 for organic waste. Although a significant portion of

organic waste will be diverted using composting and land application, additional conversion technology facilities will be needed to meet this goal.

The following milestones have been identified to measure our progress:

Timeframe	Milestone	Capacity (tons per day)	Status
Today	County Sanitation Districts anaerobic digestion co-digestion at Carson facility	84 (can be expanded in the future)	Completed
12/31/2015	Construction of Perris anaerobic digestion facility	230	Completed
12/31/2020	In-County conversion technology capacity (projection)	200	To be completed
12/31/2025	In-County conversion technology capacity (projection)	500	To be completed
12/31/2035	In-County conversion technology capacity (projection)	3,000	To be completed

After a small number of facilities become operational and demonstrate their viability, the market for CT in the County will quickly expand. Achieving 2025 and 2035 milestones will require investment by the private sector. The 2020 milestone could be achieved by the development of additional capacity at the Districts' Carson facility. In addition, the potential anaerobic digestion projects at Lancaster Landfill and PDC could be built by 2020 with streamlined permitting.

Although the County does not have direct control over the timing of the private projects, State mandates are driving business development, which will lead to projects being developed in the next few years. To accelerate this investment, Public Works can take a number of steps, as described below.

6.0 Next Steps

- Work with the Districts in continuing to implement the organic waste collection program, with the goal of increasing the anaerobic digestion of food waste in the County.
- Provide technical assistance to facilitate WM's LARGO project, including permitting assistance, environmental review, and support for grant applications.
- Present the comprehensive, peer reviewed Comparative GHG Emissions Analysis that shows the benefit of CTs at a conference to be held at Public Works in spring 2016.

- In collaboration with Regional Planning, prepare a draft Recycling and Waste Facilities Ordinance, which will ensure these types of facilities have appropriate zoning as well as permitting process.
- Continue to serve as a resource and catalyst for CT project development in the County for other CT projects in various stages of development, such as potential projects at PDC and Lancaster Landfill.

As described in Appendix A (attached), legislative barriers have historically been a major impediment to the development of CTs in California. Senate Bill 498 (SB 498, authored by Senator Ricardo Lara in 2014 and sponsored by the County), cleared a significant hurdle for the siting of biomass conversion facilities in the County by providing waste diversion and renewable energy credit to such facilities. The County will be sponsoring another CT bill that would build on the success of SB 498, by expanding the definition of biomass conversion to other types of feedstock, such as biosolids or digestate. The County prepared a recommended legislative proposal, which was approved by the Board of Supervisors adding "non-recyclable byproduct or residue from composting" to the definition of biomass in SB 498 as a way to encourage CT projects to use this feedstock.

Public Works will continue to facilitate the development of CTs in the County by working with stakeholders to identify barriers and creating solutions to those barriers as described in this report.

Public Works' next status report will be submitted in August 2016 for the period February 2016 through July 2016.

Appendix A – Legislation

Recently Adopted Legislation

Senate Bill 350
The California Clean Energy and Pollution Reduction Act of 2015 include two key proposals, doubling the energy efficiency of buildings and increasing the use of renewable electricity to 50 percent by 2030. Conversion Technology (CT) has the ability to generate renewable electricity from waste, thereby assisting the State in meeting these environmental goals. Senate Bill 350 was signed by Governor Jerry Brown on October 7, 2015.

Pending Legislation (as of January 28, 2016):

Senate Bill 32
The California Global Warming Solutions Act of 2006, also known as Assembly Bill 32, establishes a goal to reduce Statewide Comparative Greenhouse Gas (GHG) emissions equivalent to the Statewide emissions level in 1990 by 2020. Senate Bill 32, introduced by Senator Fran Pavley, requires the California Air Resources Board (CARB) to approve a Statewide GHG emission limit that is equivalent to 80 percent below the 1990 levels to be achieved by 2050. The bill would also require the State board to approve an interim GHG emissions limit equivalent to 40 percent below 1990 levels by 2030. Without CTs and the GHG emission reductions associated with these technologies it would be difficult for the State to meet these goals. Therefore, this bill could bolster the advancement of CTs. The County is evaluating this bill to determine whether to recommend taking a formal position.

Senate Bill 687
This Bill would require CARB, on or before June 30, 2017, in consultation with the State Energy Resources Conservation and Development Commission and the Public Utilities Commission to adopt a carbon-based renewable gas standard that would require all gas sellers to provide minimum percentages of renewable gas to retail customers in California. Modeled similar to the State's Renewable Portfolio Standard, which has doubled renewable electricity in the State since 2002, the required percentage of renewable gas would gradually increase from 1 to 10 percent over a 10-year period beginning in 2019 and is intended to spur the in-State biomethane market. The bill would also require the CARB to issue an analysis of the lifecycle emissions of GHGs and reductions for different biogas types and end uses by January 1, 2017. The bill is a 2-year bill, which means it will be voted on in 2016. The County is on record in support of this bill.

Assembly Bill 577
Authorized pursuant to AB 32, monies collected by the CARB from the auction or sale of GHG emission allowances, otherwise known as "cap and trade," is deposited into the GHG Reduction Fund. Assembly Bill 577 would require the State Energy Resources

Conservation and Development Commission to use an unspecified amount of money from the State's GHG Emission Reduction Fund to develop and implement a grant program to award grants for projects that produce biomethane, that build or develop collection and purification technology or infrastructure, or that upgrade or expand existing biomethane facilities. The bill is intended to provide certainty in the biogas market which may attract further private development in this sector. The County is on record in support of this bill.

AGN. NO.

MOTION BY SUPERVISOR MARK RIDLEY-THOMAS January 27, 2015

Providing Justification for Conversion Technology Investment
Relates to Agenda Item 16

Since 2010, the Los Angeles County (County) Department of Public Works has pursued various strategies to increase the utilization of non-combustion conversion technologies, which are aimed at reducing the amount of waste being sent to landfills, and are considered sustainable waste management solutions.

These facilities have proven to be very difficult to develop locally. Various legislative and regulatory frameworks have made these facilities complicated to permit and operate in California. The County has promoted alternative methods of waste disposal, and provided technical assistance to project developers to further this effort. However, there are no commercial-scale facilities yet operational within the County.

Progress was made in 2014 with the passage of County-sponsored Senate Bill 498, which helps clear the pathway to allow cleaner and more efficient technologies to be used to make low-carbon fuels as well as renewable energy from certain types of organic waste. However, significant work still needs to be done to ensure these technologies can be scalable to meet the County's goals. The Board of Supervisors (Board) recently approved a roadmap for a sustainable waste management future, which entails diverting 80 percent of solid waste from landfills by 2025.

- MORE -

MOTION

SOLIS _____

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In 2014, Governor Brown also signed into law AB 1826, which requires businesses and government entities which generate organic waste to recycle. This bill also requires local jurisdictions to develop an organics management plan by December 31, 2015. This will require the waste industry to develop a number of conversion technology facilities to process organic material and the County to facilitate the permitting and development of these facilities.

Deployment of conversion technologies may help to divert a substantial amount of this waste stream. In order to realize this goal, the County must identify the specific barriers to rapidly and cost-effectively developing commercial-scale projects within the County. The Board should review data on the cost-effectiveness of this strategy and have a realistic sense of the timeframe and viability of scaling up this investment to meet the County's waste management needs.

I THEREFORE MOVE THAT THE BOARD OF SUPERVISORS:

Direct the Director of the Department of Public Works to provide semi-annual reports in writing that include clear benchmarks for measuring the actual progress being made towards establishing viable conversion technology projects (including amount of waste to be diverted, financial viability, project status, and significant impediments) that will allow the Board of Supervisors to meaningfully assess the efficacy of conversion technologies in meeting the County of Los Angeles' goal of a sustainable waste management future.

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COUNTY OF LOS ANGELES

DEPARTMENT OF PUBLIC WORKS

"To Enrich Lives Through Effective and Caring Service"

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GAIL FARBER, Director

ADDRESS ALL CORRESPONDENCE TO:
P.O. BOX 1460
ALHAMBRA, CALIFORNIA 91802-1460

IN REPLY PLEASE
REFER TO FILE: EP-4
A4209-3

August 17, 2016

TO: Each Supervisor

FROM: Gail Farber
Director of Public Works

BOARD MOTION OF JANUARY 27, 2015, ITEM NO. 21-A
CONVERSION TECHNOLOGY PROJECTS
SEMI-ANNUAL STATUS REPORT: FEBRUARY THROUGH JULY 2016

On January 27, 2015, the Board adopted a motion by Supervisor Mark Ridley-Thomas instructing the Director of Public Works to provide semi-annual reports in writing that include clear benchmarks for measuring the actual progress being made towards establishing viable conversion technology projects, in conjunction with the Boards' approval of a technical services contract with Alternative Resources Incorporated to assist the County of Los Angeles and potential project developers in developing conversion technology projects in the County.

Attached is the third report in response to this motion for the period of February through July 2016. Future updates on Public Works' conversion technology efforts will be provided within the annual Roadmap to a Sustainable Waste Management Future report. If you have any questions regarding this report, please contact me or your staff may contact Mr. Daniel J. Lafferty at (626) 458-3500 or dlaff@dpw.lacounty.gov.

CS:jl
H/ao/EPD/Semi-Annual CT Memo Feb-July 2016

Attach.

cc: Chief Executive Office (Rochelle Goff)
County Counsel
Executive Office
Department of Public Health
Department of Regional Planning
Los Angeles County Integrated Waste Management Task Force
Regional Planning Commission
Sanitation Districts of Los Angeles County

CONVERSION TECHNOLOGY PROGRAM

SEMI-ANNUAL STATUS REPORT

February 2016 – July 2016

Prepared by the County of Los Angeles Department of Public Works

Cover Photos

Top Left: Pitchess Detention Center in Castaic, CA

Top Right: County Sanitation Districts Organics Recovery Pilot in Puente Hills, CA

Bottom: CR&R Anaerobic Digestion Facility (Rendering) in Perris, CA

1.0 Executive Summary

This is the third report, in response to the January 27, 2015, motion by Supervisor Mark Ridley-Thomas reporting on progress of conversion technology (CT). The report details progress of three CT projects in the last 6 months, as well as public outreach, benchmarking, milestones, and next steps. The projects are:

1. Joint Water Pollution Control Plant – County Sanitation Districts (Districts) and Waste Management Inc. (WM) continue to digest food waste at the Districts' Plant in the City of Carson. Public Works and the Districts continue to conduct pilot food waste collection programs in unincorporated areas of Los Angeles County, which was a large reason for the increased supply of digested food waste from 25 tons per day (tpd) to 40 tpd.

2. Perris Materials Recovery Facility, CR&R Incorporated – This privately developed anaerobic digestion facility in Riverside County will begin operating the 230 tpd Phase I digester in fall 2016. Construction of Phase II is approximately 50 percent complete and should be completed by the end of 2016.

3. Pitchess Detention Center, Los Angeles County Sheriff's Department – This proposed $20 million project would digest 40,000 tons per year (tpy) of organic waste from the Pitchess Detention Center (PDC), in addition to nearby County facilities, and the surrounding region. Public Works is providing technical assistance to the Sheriff's Department and preparing a draft Request for Qualifications and Proposals.

Public Outreach – The 2016 Southern California Conversion Technology Conference was hosted by Public Works on July 29, 2016. The conference was very successful in educating stakeholders on the benefits of conversion technologies and what needs to be done to overcome the barriers to their development.

Benchmarking and Milestones – The initial Semi-Annual Report established numerical milestones to measure progress in implementing the CT program starting with the current in-County CT capacity of 65 tpd and continuously increasing the capacity to reach 3,000 tpd of conversion capacity by 2035. In addition to the potential project at PDC, the Districts' facility in Carson is likely to develop additional capacity. Thus, the County is on track to achieve the next milestone of 200 tpd in-County waste conversion capacity by 2020.

Conclusion – CTs have the ability to play a critical role in reducing our reliance on landfills and recovering energy, fuels, and other products from waste. Public Works will continue to facilitate the development of these projects by providing technical assistance, educating stakeholders, and working to remove regulatory barriers.

2.0 Background

On January 27, 2015, the County of Los Angeles Board of Supervisors adopted a motion by Supervisor Mark Ridley-Thomas instructing the Director of Public Works to provide semi-annual reports in writing that include clear benchmarks for measuring the actual progress being made towards establishing viable CT projects, including the amount of waste to be diverted, financial viability, project status, and significant impediments that will allow the Board to meaningfully assess the efficacy of CTs in meeting the County's goal of a sustainable waste management future. This is the third report in response to that motion for the period of February 2016 to July 2016.

In October 2014, the Board adopted the Roadmap to a Sustainable Waste Management Future, which established waste diversion targets of 80 percent by 2025, 90 percent by 2035, and 95 percent or more by 2045. The successful development of CTs is important in achieving these targets since it is not economically feasible to reduce, reuse, or recycle the entire waste stream.

3.0 Project Development Highlights

The following CT projects have achieved progress in the last 6 months.

3.1 Joint Water Pollution Control Plant (JWPCP), County Sanitation Districts of Los Angeles County and Waste Management Inc.

In 2013, the County Sanitation Districts partnered with Waste Management (WM) to establish a demonstration project at the Districts' Joint Water Pollution Control Plant (JWPCP) in the City of Carson, California. As part of this project, WM collects food waste, cleans and processes it into a slurry and delivers it to the JWPCP where it is co-digested with sewage sludge to create biogas, which is converted into electricity. WM recently increased the supply of food waste to JWPCP from 25 tpd to 40 tpd, largely due to the continued food waste collection pilot programs within the Garbage Disposal Districts (GDDs), which began in October 2015 as first noted in our previous report. The Districts determined that it can be technically viable to expand the co-digestion project at JWPCP into a commercial-scale anaerobic digestion facility.

Starting in July 2016, the food waste pilot collection program was expanded to include the County's commercial franchise. This program will provide insight on the challenges and costs associated with separate organic waste collection, which can be reviewed before being implemented throughout the unincorporated County areas. The pilot programs are expected to further increase the amount of food waste already being digested at the JWPCP and thus, increasing the production of biogas.

In addition, the Districts partnered with Anaergia, a renewable energy and waste-to-resources company, to pilot a small-scale "press" at the Puente Hills Materials

Recovery Facility. The press is an advanced material separation technology that recovers organics from the waste stream by separating the dry inorganic fraction of the waste from the wet organic fraction. Public Works sent waste from County unincorporated areas including GDDs and commercial franchise accounts during the testing of the press. The press will also help with determining organics recovery rates and contamination levels of different types of commercial and residential loads. A complete analysis and report of the results is currently being prepared by the Districts.

The Districts also signed a contract to convert 144 tpd of the biosolids from JWPCP to biofuel using pyrolysis and Fischer-Tropsch Technology at a facility in Rialto, California. The project has completed all air quality testing permits and is expected to complete construction by the end of 2016. Pyrolysis is a type of gasification, which is a non-combustion thermal conversion technology. The Fischer-Tropsch Technology uses chemical processes to convert gases into liquid fuels.

3.2 Perris Materials Recovery Facility, CR&R Incorporated

CR&R Waste and Recycling Services, a local solid waste management company, has completed construction of a 230 tpd anaerobic digestion project at the Perris Materials Recovery Facility and Transfer Station in Riverside County. The project is designed to convert organic waste into renewable fuels for use by their waste collection vehicles.

This facility has plans to scale-up in four equal phases and ultimately digest up to 1,075 tpd, which could allow the facility to process organic waste generated in County of Los Angeles unincorporated areas. The facility is also expected to process waste from the City of Los Angeles starting in 2017. Construction of the Phase I digester has been completed and all testing for gas and water leaks have passed. Phase I began seeding (the inoculation process of introducing bacteria with existing digestate) on August 1, 2016. Full operation began shortly thereafter. Construction of Phase II is approximately 50 percent complete and should be operational by the end of the year. The facility will serve as a reference for viable CT projects that can separate the organic fraction of the waste stream, and we are benefiting from the lessons learned in successfully developing this project.

3.3 Pitchess Detention Center, Los Angeles County Sheriff's Department

The Los Angeles County Sheriff's Department (LASD) with assistance from Public Works is analyzing the feasibility of implementing an anaerobic digestion system at Pitchess Detention Center (PDC), a cluster of jail facilities in Castaic, California. It has been calculated that a facility capacity of at least 40,000 tons per year (approximately 130 tpd) is viable. However, additional consideration would need to be given to the availability and commitment of organic waste feedstock within the region.

The system would include an anaerobic digester, which would process source-separated food and green waste to create biogas for energy generation and

heat as well as compost for farming operations. Such a facility could receive and process food and green waste from other County departments, as well as potentially the surrounding areas and provide compost and renewable energy or biofuels to other County departments.

Public Works is currently working with Alternative Resources Inc. (ARI) and LASD to prepare a Request for Qualifications and Proposals (RFQP). The RFQP for the concept project would have an option to bid with either public or private ownership. In the private ownership scenario, the owner would deliver PDC feedstock and receive or beneficially use biogas and compost. The contractor would design, build, own, and operate the facility and would be responsible for marketing excess compost and coming to an agreed upon rate with LASD for the biogas generated. In the private ownership option, the contractor would assume project risk and be responsible for feedstock acquisition.

In the public ownership scenario, the County would own and finance the facility and assume project risk. The facility would be developed for a known amount of feedstock controlled by the County and may engage a broker to help secure the feedstock. In the public ownership scenario, the County could promote the project as a County-owned sustainability effort.

The proposed project has numerous potential benefits. It would help conserve natural resources and reduce landfill disposal, thereby assisting County departments and potentially businesses in complying with State mandates, including Assembly Bill (AB) 1826, AB 341, and AB 32. This project aligns with the strategies outlined in the Roadmap to a Sustainable Waste Management Future and County Strategic Plan. By diverting food waste into the composting and anaerobic digestion system, the project would reduce traffic and pollution from trash hauling. The anaerobic digestion facility would be mutually beneficial to all parties involved and create useful products including a rich soil amendment for PDC farmland and biogas that could be used for low carbon electricity and heat generation, and vehicle fuel. The facility would also reduce costs associated with trash disposal, water usage and sewer fees, kitchen clarifier cleanout fees, and compost expenses. Additionally, the project could potentially provide job training opportunities for inmates or job opportunities for former inmates.

The estimated capital cost of the project is approximately $20 million including piping to transport the biogas to the power plant, with a total annual operation and maintenance cost of approximately $2 million. Project costs could be offset by revenue generated from waste tipping fees and sale of excess compost, in addition to decreasing costs associated with waste disposal and purchase of natural gas to generate heat and electricity. There are also many upcoming grant opportunities that can help offset project costs; however, they require the project to be shovel-ready.

4.0 Public Outreach

A Comparative Greenhouse Gas (GHG) Emissions Analysis was commissioned by Public Works to compare the net GHG emissions of two scenarios. The baseline scenario is a transport and disposal of residuals from a mixed waste Materials Recovery Facility (MRF) in a modern sanitary landfill. The alternative scenario is processing the residuals at an Integrated MRF with CT. The Comparative Analysis shows the net environmental benefits of managing residual solid waste using anaerobic digestion and gasification at an integrated MRF facility as opposed to transporting it to a landfill for disposal. This analysis will provide tremendous assistance in educating stakeholders of the necessity for CT facilities to improve air quality and combat climate change. Public Works released the Comparative Analysis in February 2016, which has been mentioned in multiple waste management media articles.

4.1 Southern California Conversion Technology Conference

On July 29, 2016, Public Works hosted the Southern California Conversion Technology Conference, which was attended by approximately 200 people. The goal of the conference was to educate conference attendees, which were made up of elected officials, regulators, representatives of local jurisdictions, members of industry, and environmental groups, on the many benefits of an integrated approach with CTs. Conference agenda topics included: conversion technologies and best practices throughout the world, environmental findings from CT studies and projects, CTs and sustainability, and California projects, permitting, and legislation. There were a total of 20 speakers including Assemblymember Mike Gatto.

Because of the success of the 2016 Conference, Public Works plans to host more CT conferences in the future. Videos of the conference panels will be posted on the www.SoCalConversion.org website.

5.0 Benchmarking and Milestones

The goal for the CT program is to reduce the dependence on landfills and ensure there is sufficient, sustainable capacity available to the County to meet future needs. Public Works set benchmarks for the program based on current waste disposal quantities and the disposal reduction targets established in the County's Roadmap as well as State laws, such as AB 1826 for organic waste. Although a significant portion of organic waste will be diverted using composting and land application, additional CT facilities will be needed to meet this goal.

The following milestones have been identified to measure our progress:

Timeframe	Milestone	Capacity (tons per day)	Status
Today	County Sanitation Districts anaerobic digestion co-digestion at Carson facility	65* (can be expanded in the future)	Completed
12/31/2015	Construction of Perris anaerobic digestion facility	230	Completed
12/31/2020	In-County conversion technology capacity (projection)	200	On track
12/31/2025	In-County conversion technology capacity (projection)	500	On track
12/31/2035	In-County conversion technology capacity (projection)	3,000	On track

*This was reported as 84 tpd in previous reports, which was the amount of slurry that can currently be digested. The amount of food waste that can be digested is 65 tpd with the water being the remaining 19 tpd, which needs to be added to create the slurry.

After a small number of facilities become operational and demonstrate their viability, the market for CT in the County will quickly expand. Achieving 2025 and 2035 milestones will require investment by the private sector. The 2020 milestone could be achieved by the development of additional capacity at the Districts' Carson facility. In addition, the potential anaerobic digestion projects at PDC could be built by 2020 with streamlined permitting.

Although the County does not have direct control over the timing of the private projects, State mandates are driving business development, which will lead to projects being developed in the next few years. To accelerate this investment, Public Works can take a number of steps, as described below.

6.0 Next Steps

- Work with the Districts in continuing to implement the organic waste collection program, with the goal of increasing the anaerobic digestion of food waste in the County.
- Work with Alternative Resources Inc. and LASD on finalizing the RFQP for the project at PDC.
- In collaboration with Regional Planning, prepare a draft Recycling and Waste Facilities Ordinance, which will ensure these types of facilities have appropriate zoning as well as a streamlined permitting process.

- Obtain feedback from 2016 conference and implement suggested changes into project development, grant requests, future legislation, and future conferences.
- Continue to serve as a resource and catalyst for CT project development in the County for other CT projects in various stages of development, such as potential projects at PDC.
- Work with ARI to update list of potential CT sites and look for potential sites that were not identified in the past.

Legislative barriers have historically been a major impediment to the development of CTs in California. Senate Bill 498 (SB 498), authored by Senator Ricardo Lara in 2014 and sponsored by the County, cleared a significant hurdle for the siting of biomass conversion facilities in the County by providing waste diversion and renewable energy credit to such facilities. The County prepared a recommended legislative proposal, which was approved by the Board of Supervisors, adding "non-recyclable byproduct or residue from composting" to the definition of biomass as a way to encourage CT projects to use this feedstock. The County is working with Assemblymember Das Williams to incorporate these amendments into AB 2313. If signed into law, these provisions would build on the success of SB 498.

Public Works will continue to facilitate the development of CTs in the County by working with stakeholders to identify barriers and creating solutions to those barriers as described in this report.

Public Works' next status report will be submitted in October 2017 as part of the annual Roadmap to a Sustainable Waste Management Future report.